

# Comparison of the two leading approaches to attending wound care dressings

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## Abstract

Many nurses practise wound dressing based upon knowledge of sequential procedural steps rather than understanding the principles underpinning the most effective approaches to wound dressing. Currently two leading dressing approaches, aseptic (clean hand/dirty hand) technique and wound field, are being taught to undergraduate nursing students. Collectively and comparatively, both techniques have evoked some controversy regarding the most appropriate and effective technique to apply. This paper clarifies the differences between these approaches and suggests that both techniques will have similar outcomes providing the principles of minimising or eliminating risks associated with contamination are practised.

## Introduction

It has been shown that wound infections account for up to 38% of all hospital-acquired infections (HAIs)<sup>1,2</sup>. HAIs present a serious hazard to patients, and are a significant legal and economic liability to healthcare institutions and the community<sup>3</sup>. There is an unequivocal relationship between the standards of wound management and the rise in HAIs rates<sup>2</sup>. As patient advocates, nurses are responsible for providing and maintaining optimal wound care practices that minimise the risk of HAIs. Failure to do so may well compromise patient safety and expose patients to unnecessary harm. Therefore, it is essential that nurses are able to draw on a framework that is principle-based in order to provide safe and appropriate wound care management.

In the Australian healthcare context, aseptic technique and wound field concept are predominant approaches taught and used in clinical environments in relation to performing wound dressings. Nonetheless, the approach of choice

remains a contentious issue for many nurses<sup>4,5</sup>. The method of choice appears to be contingent on situational factors such as the preferences and skills of individual nurses, and/or the particular healthcare context (e.g., departmental policy). To date, there has been limited discussion in the literature that would serve to inform clinical practice in this aspect of wound management.

In order to provide clarification, the aims of the paper are three-fold: 1) to define aseptic technique and wound field concept in the context of wound dressing; 2) to outline the fundamental differences and similarities between aseptic technique and wound field concept; and, 3) to make recommendations for clinical practice based on the literature. Exploration of the principles that underpin wound cleansing is not within the remit of this paper as there is a litany of discussion which provides justification for their use elsewhere<sup>4,6,7</sup>.

## Clinical challenges associated with ambiguities of choice

The disparity in the choice of wound dressing approach (aseptic technique versus wound field concept) has contributed to discernable challenges in teaching wound management to undergraduate nurses within the clinical context<sup>5,8</sup>. In the nursing laboratory, undergraduate nurses are taught the principles of wound care, and recognise that they will be expected to perform wound dressing early in their clinical experience. However, with this expectation comes the concern that the 'correct' dressing technique is demonstrated. In the clinical setting, the dressing technique of undergraduate nurses is often monitored and evaluated by qualified nurses who have been taught 'traditional' wound dressing approaches, such as aseptic technique. Additionally,

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more recently, undergraduate nurses are being taught wound dressing methods using the wound field concept in the nursing laboratory. Consequently, the differences in these two wound dressing approaches have generated some confusion among undergraduate and qualified nurses alike in respect to their theoretical premises and clinical applications.

In the clinical setting, wound dressing techniques are still largely taught using a procedural approach; a series of sequential steps in the absence of an adequate rationale for such steps. Any departure in the prescribed order of these steps is conjectured to jeopardise the cleanliness of the procedure, and consequently increase the patient's risk of acquiring a wound infection<sup>5</sup>. Accordingly, the practices incorporated in performing wound dressings are, in many instances, underpinned by ritualistic practices rather than being principle-based<sup>4</sup>.

Using this restricted approach also overlooks the nuances of the clinical context – wound dressing techniques and skills have historically been taught and performed in isolation of the patient<sup>9</sup>. That is, in the absence of a holistic assessment of the patient that takes into account the type of wound (i.e. acute/chronic, deep/superficial, location etc), the presence of patient co-morbidities<sup>10</sup>, and even the patient's physical environment (i.e. ward/home)<sup>5</sup>. To be truly holistic, irrespective of which dressing approach is used, nurses must perform a patient assessment which considers the unique needs of the patient and their context (hospital, home, clinic or GP surgery etc)<sup>11</sup>.

## Wound classification terms

Central to any discussion in relation to wound management and dressing technique is defining the terms contamination, colonisation and infection in the context of wound care. Contamination is defined as the presence of non-replicating microorganisms<sup>9</sup>. Normal skin microflora includes *Staphylococcus*, *Streptococcus*, *Acinetobacter*, *Peptococcus*, and yeast. Intact skin may be contaminated with up to 10<sup>3</sup> microbes per gram of tissue without any detrimental effect on tissue healing<sup>10</sup>. Contamination can also occur as a result of the introduction of inanimate objects to the wound's surface. Thus, wound contamination occurs in two ways; endogenously through the patient's own flora, or exogenously whereby microbes are introduced through external sources, such as the nurse's hands<sup>12</sup>.

In addition to contamination, terms such as colonisation and infection are used to describe the microbial status of a wound<sup>9</sup>. Colonisation refers to the adherence and multiplication of microorganisms to the body's surface. Critical colonisation occurs when the bacterial load increases

and adversely affects the patient. Infection is defined as the multiplication and invasion of microorganisms causing local cellular damage and potential systemic illness<sup>9,11</sup>. This is especially significant in the clinical environment when a hospital strain of pathogenic bacteria is transmitted and replaces the patient's own natural flora<sup>11</sup>. While contamination and colonisation are natural occurrences, critical colonisation and infection are not<sup>9,10</sup>.

Nevertheless, while all patients are potentially vulnerable to infection, certain situations heighten vulnerability such as the presence of co-morbidities, extensive burns, and immune disorders that compromise the body's natural defences<sup>13,14</sup>. Therefore, it is imperative that nurses adopt practices that ensure that pathogens, particularly bacteria, are excluded from entering open sites during invasive and other procedures where the body's natural defences are bypassed<sup>15</sup>. Aseptic technique is considered the frontline of defence against the transmission of infection<sup>16,17</sup>. Poor aseptic techniques can lead to contamination of the wound and compromise patient safety.

## Aseptic technique

Asepsis refers to "the absence of germs, infection and septic matter"<sup>15</sup>. All materials used in the dressing procedure are required to be sterile as opposed to being just 'clean'<sup>9,16</sup>. To achieve asepsis, only sterile objects and fluid are allowed to come in contact with the wound<sup>18</sup>. Nonetheless, asepsis is difficult to achieve because pathogens are resident throughout various areas of the body. For instance, *Staphylococcus aureus* is present on the surface of the skin, and *Escherichia coli* are part of the bowel's natural flora (endogenous)<sup>14</sup>.

Traditionally, the wound has been considered separate to the dressing field using aseptic techniques<sup>11</sup>. Therefore, any exudate from the wound and its immediate surrounds must be isolated from the dressing field since it has the potential to contaminate the wound and the dressing field. The underlying practice of aseptic technique centres on the following guidelines:

- Knowing what is sterile.
- Knowing what is not sterile.
- Separating the dressing and wound areas.
- Removing contaminated or non-sterile items from the field.
- Ensuring non-sterile items do not cross above the sterile field.
- Correcting any infractions that occur during the wound dressing procedure.

Methods such as the use of forceps and/or gloves may also be incorporated in aseptic techniques. Ideally, when using forceps, the swab is transferred from the 'clean' forcep to the 'dirty' forcep where it comes into contact with the wound surface. This concept of clean versus dirty has commonly been referred to in clinical practice as the 'clean hand, dirty hand' technique. Basically, the two opposing forceps and/or gloves should not come into contact with each other. If this should occur, it would immediately render the clean forcep contaminated, necessitating disposal of this item.

This historical concept of 'clean hand, dirty hand' dressing technique emerged from the principles of cross-contamination. Each night the 'clean nurse' would sterilise the necessary equipment to be used in the daily dressing rounds, such as gallipots and gauzes<sup>19</sup>. Each day the 'dirty nurse' would make use of these sterile gallipots and gauzes to assist in wound cleansing and dressing<sup>19</sup>. Primarily, neither nurse intruded on each other's designated clean or dirty area, thus, preventing any cross-contamination. However nowadays, with associated workplace demands, the roles of these two nurses have been condensed into a singular nursing role, where one hand is considered clean and other hand considered dirty. Thus, the practice of clean hand, dirty hand technique emerged. The following discussion considers wound management using an alternative approach to aseptic technique, the wound field concept.

## Wound field concept

Wound field concept has emerged as a sound alternative to aseptic technique. The term wound field applies to, and is inclusive of, the wound surface, wound periwound, and the dressing surface<sup>5,8</sup>. The guiding principle underpinning wound field concept is the recognition that wounds are, in themselves, unique micro-environments and, once exposed, are not sterile<sup>5</sup>. Consequently, the contaminants of the patient and their wound will not further infect the wound. Only exogenous items introduced onto the wound surface, wound periwound, and/or dressing surface have the potential to cause further infection. For example, exudate from another wound, the external aspect of the dressing pack, or clothing touching the wound, are all exogenous and considered potential contaminants. Hence, in this way, contamination is not only viewed as a condition, it is also viewed as an 'act' because of the physical placement of microorganisms into a wound<sup>20</sup>.

The definition of contamination as it applies to wound field concept suggests that a wound can be repeatedly contaminated if exogenous microorganisms are introduced into this wound<sup>20</sup>. However, contamination will not occur if the materials that are repeatedly used during the dressing,

such as forceps with associated wound exudate, are re-introduced back onto the wound surface, providing they have only contacted the wound or dressing surfaces<sup>5</sup>. This act is considered to be a reintroduction of microorganisms to the wound surface, not contamination<sup>20</sup>. The principle underpinning this concept is that all wounds contain microorganisms, and only microorganisms from outside the wound (exogenous) will contaminate the wound<sup>20</sup>. Table 1 outlines specific similarities and differences in the aseptic and wound field approaches in greater detail.

## Discussion

Wound field concept considers the wound as part of the dressing field<sup>20</sup>. In contrast, traditional teaching of aseptic technique in wound dressing management advocates that the wound, including the periwound, is not considered part of the dressing field. In aseptic technique the wound is regarded as being separate to the dressing field, therefore, endogenous exudate swabbed from the wound bed is viewed as a potential contaminant. This means that the re-introduction of endogenous wound exudate will re-contaminate the wound if inadvertently placed back onto the wound with a swab, hence the need to swap clean and dirty forceps during the procedure<sup>13</sup>. Additionally, if exudate from the dirty forcep was to touch the clean forcep, the sterility of the field, including forceps and swabs, would be jeopardised<sup>4</sup>. The principle underpinning aseptic technique requires that any exudate arising from the wound bed must be isolated from the sterile field<sup>16</sup>.

Using wound field concept, the endogenous wound exudate is considered part of the wound's unique microorganism environment<sup>5</sup>. The transfer from clean to the dirty forceps is not necessary during this dressing procedure, nor is the need to isolate the swabs containing wound exudate from the dressing field. Therefore, the procedural focus is shifted from the notion of clean and dirty (aseptic technique) to the uniqueness of the wound environment<sup>20</sup>.

In relation to using an aseptic approach, Bree-Williams & Waterman<sup>4</sup> noted that the non-touch technique using clean and dirty forceps was, in many instances, being used incorrectly as forceps were difficult to manipulate and nurses were often confused with the sequence of steps. This study also indicated that nurses could not always explain the rationale for their actions and that aseptic practices were not necessarily evidence-based<sup>4</sup>. Similar discrepancies were identified among medical staff<sup>21</sup>. However, given the paucity of research to date, it is hardly surprising that many aspects of aseptic techniques have been based on ritual and carried out without question<sup>4</sup>.

The teaching of wound management using the principles of asepsis has been the prevailing doctrine as evidenced in many of the popular nursing texts as well as microbiology, infection control and operating theatre texts<sup>17,22</sup>. Undoubtedly, the validity of aseptic techniques within environments such as the operating theatre (where their development originated) cannot be disputed<sup>1</sup>. Yet, a fundamental difference between operating theatre environments and other clinical environments is that the operating theatre has rigorous standards of asepsis practised at all times, whereas most other settings are not designed to meet these standards set in the operating theatre. While the goal of any clinical setting is to minimise the risk of HAIs, most clinical settings outside of the operating theatre do not allow for the same strict level of asepsis. Moreover, some wound care experts assert that it is more difficult to reconcile the broader application of the notion of a 'sterile field' to more uncontrolled environments such as the ward areas or the patient's home setting<sup>5</sup>.

It is essential during either wound dressing approach (aseptic or wound field concept) that the use of a clearly defined wound and dressing field, as well as hand washing and the wearing of gloves and other personal protective equipment, are critical practices. Essentially both approaches still require sterile equipment and dressing materials, which effectively means only items that are non-sterile have the potential to contaminate the wound surface, periwound and dressing surface<sup>2,20</sup>.

## Recommendations for education and clinical practice

In essence, using either aseptic technique or wound field concept, if well understood and practised according to the principles that underpin each approach, will minimise the risk of wound infection<sup>2,20</sup>. It is imperative to make appropriate intra-procedural decisions which encompass an understanding of contamination as it applies to the wound dressing procedure<sup>20</sup> as well as take into account consideration of specific patient-related factors, such as wound type and location, patient co-morbidities and environment<sup>10</sup>.

Irrespective of which approach is performed, aseptic technique or wound field concept, there are a number of salient points that need to be considered. First, limiting the contact between the nurse's hands and the patient's exposed wound is the most effective means of reducing the potential for wound contamination<sup>9,20</sup>. Undoubtedly, hand washing is the single most important factor in the prevention of the transmission of infection<sup>11</sup>. The relationship between poor hand hygiene and HAIs is well documented<sup>2,22</sup>. Hand washing should be undertaken before and after wound care, and following removal of gloves<sup>23</sup>. Previous studies have identified that healthcare professionals wash their hands frequently; however, that they lacked consistency and uniformity<sup>4,21</sup>.

Table 1. Differences in aseptic technique and wound field concept.

Characteristic	Aseptic (clean hand/dirty hand) technique	Wound field concept
Wound environment	Wound surface is considered contaminated	Wound surface is considered contaminated
Dressing environment	Dressing surface is considered sterile and is separate to the wound surface	Dressing surface is synergistic with the wound surface
Concept origin	Operating theatres Sterile	Community settings Clean
Wound field	Any surface below or outside of the wound and dressing/draped area is considered non-sterile	The wound surface, periwound and dressing surface are synergistic with each other. Thus, dressing and wound surfaces are incorporated into, and are part of, the overall wound field
Contaminates to the wound field	Endogenous (wound exudate) and exogenous (clothing etc) agents are considered contaminants and must be isolated from the dressing surface	Exogenous agents only, basically any object that has touched an area outside of the wound field and is now introduced back into the wound field. NB: Another wound located on the same person is considered exogenous
Consequences of contamination	Contaminants have the potential to cause wound infection	Contaminants have the potential to cause wound infection

The correct use of gloves in the clinical setting is part of standard precautions, the aim of which is to reduce the transmission of microorganisms from recognised and unrecognised sources of infection<sup>23</sup>. As such, many wound care experts recognise that the wearing of gloves is accepted practice in wound dressings and suggest that non-sterile gloves be worn if performing non-invasive dressing procedures<sup>9, 14</sup>. Xavier<sup>24</sup> caveats this by stating that sterile gloves should be worn if the nurse's hands come in contact with sterile body surfaces as likely during invasive procedures such as urinary catheterisation. Non-sterile gloves are appropriate if stored correctly and there are risks that the nurse will make contact with body fluid or wound exudate through splashing<sup>14</sup>. The wearing of gloves does not alter the need for scrupulous hand washing.

It is also recommended that nurses conduct risk assessments protocols, attend educational updates and seminars on wound care, and conduct regular wound care audits<sup>2</sup>. This will promote consistency in wound care techniques as well as an understanding of the rationale for wound care.

## Conclusion

Saliently, the goals of any wound care approach are to optimise primary wound healing, prevent surgical infection, and minimise the recovery period following surgery. Many ritualistic wound dressing practices have prevailed in the absence of clinical research. While aseptic technique and wound field concept are the two leading approaches used and taught in Australian healthcare environments, either approach may be used in wound dressings without compromising patient safety. Using a framework based on principles rather than relying on a set of prescriptive steps to perform wound dressings will enable nurses to better understand the consequences of their actions and thus contribute to reducing the risk of HAIs.

## References

1. Ford D & Koehler S. A creative process for reinforcing aseptic technique practices. *AORN J* 2001; **73**:446-50.
2. Preston R. Aseptic technique: evidence-based approach to patient safety. *Br J Nurs* 2005; **14**:540-6.
3. Graves N. Economics and preventing hospital-acquired infection. *Emerg Infect Dis* 2004; **10**:561-6.
4. Bree-Williams F & Waterman H. An examination of nurses' practices when performing aseptic technique for wound dressings. *J Adv Nurs* 1996; **23**:48-54.
5. Blunt J. Wound cleansing: ritualistic or research-based practice? *Nurs Stand* 2001; **16**:33-36.
6. Hollinworth H. Using a non-sterile technique in wound care. *Prof Nurse* 1998; **13**:226-229.
7. Ellis T & Beckman A. The wound field concept: a new approach to teaching and conceptualising wound dressing. *Prim Intent* 1997; **5**:28-32.
8. Fenwick C. Wound fields and the undergraduate nurse. *Aust Nurs J* 2006; **13**:41.

9. Myers B. *Wound Management: Principles and Practices* (2nd ed). Upper Saddle River, New Jersey: Prentice Hall, 2008.
10. Carville K. *Wound Care Manual* (5th ed). Perth: Silver Chain, 2005.
11. Briggs M, Wilson S & Fuller A. The principles of aseptic technique. *Prof Nurse* 1996; **11**:805-10.
12. Dow G, Browne A & Sibbald G. Infection in chronic wounds: controversies in diagnosis and treatment. *Ostomy Wound Manag* 1999; **45**:23-40.
13. Gilmour D. Redefining aseptic technique. *J Comm Nurs* 1999; **13**:22-6.
14. Meeres P, McPherson M & Sedgewick J. *Infection Control in Health Care* (2nd ed). London: Stanley Thornes Publishers, 1997.
15. Bruen E. Clean/dirty scrub technique: is it worth the effort? *Br J Periop Nurs* 2001; **11**:532-7.
16. Gilmour D. Is aseptic technique always necessary? *J Comm Nurs Online* 2000; **14**.
17. Meeker M & Rothrock J. *Alexander's Care of the Patient in Surgery* (10th ed). St Louis: Mosby, 2006.
18. Shoup A, Kless J & Duncan A. Intraoperative care. In: Brown D & Edwards H (Eds). *Lewis's Medical-Surgical Nursing: Assessment and Management of Clinical Problems* (2nd ed). Sydney: Mosby-Elsevier, 2008.
19. Dealey C. *The Care of Wounds: A Guide for Nurses* (3rd ed). Oxford, 2005.
20. Ellis T. CPD: understanding the act of contamination in wound dressing procedure. *Collegian* 2004; **11**:39-42.
21. Sellors J, Cyne A & Simmons S. Aseptic precautions for inserting an epidural catheter: a survey of obstetric anaesthetists. *Anaesthesia* 2003; **57**:593-6.
22. Al-Damouk M, Pudney E & Bleetman A. Hand hygiene and aseptic technique in the emergency department. *J Hosp Infect* 2004; **56**:137-41.
23. Flores A. Appropriate glove use in the prevention of cross-infection. *Nurs Stand* 2007; **21**:45-8.
24. Xavier G. Asepsis. *Nurs Stand* 1999; **13**:49-53.

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## Erratum

In the last issue of *Wound Practice and Research* (Volume 17 Number 1 February 2009), an error in the definitions used to classify infected and colonised wounds were published in the article *A survey of clinicians' perceptions of, and product choices for, the infected wound*. The correct definitions are as follows:

- Colonised wound: Microbial species successfully grow and divide, but do not cause damage to the host or initiate wound infection.
- Infected wound: Microbial growth, multiplication and invasion into host tissue leads to cellular injury and overt host immunological reactions. Wound healing is interrupted.